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PSYCHOLOGY AS SO-CALLED "NATURAL SCIENCE."

QUESTIONS concerning the nature, problem, and legitimate methods of Psychology, and concerning the relations which it sustains to other forms of science and to metaphysics, are apparently far from being settled to the entire satisfaction of all parties to the controversy. No apology is, therefore, needed for discussing these questions in the first number of a new philosophical magazine. Scarcely more need is there of apology for making the recent book of Professor James¹ the occasion — or, perhaps, it would be more correct to say, the text — for our proposed discussion. These volumes are so learned, so full, so interesting, so frank, so "pronounced" on doubtful issues, and — I may add — so provoking, that they are particularly well suited to such a purpose. And if the comment is at all to resemble the text, it must be nimble in its movement, and striking in its postures, even at the risk of sacrificing something customary, if not essential to philosophical gravity of demeanor.

Although it is not intended to pass in review the entire contents of this work, or even to indicate all its marked excellences and defects, some general characterization of it seems almost indispensable. The most obvious criticism which the expert reader will offer is this: here are two bulky volumes, but they scarcely make *one book*, in the sense in which we are accustomed to use the word "book," of a connected scientific treatise. These volumes, that is, are a collection of articles, written with extraordinarily full mind and free hand. But no explanation — from whatever view of the nature, scope, and method of psycho-

¹ The Principles of Psychology, by William James, Professor of Psychology in Harvard University. 2 volumes. New York: Henry Holt and Company, 1890.

logical science derived—can make it clear, why some things are given with great detail and others wholly omitted; or why the proportion, and order, and relative space, assigned to the articles in this collection are such as the author has chosen.

Doubtless this same fact accounts, in part, for the great difficulty which the critical reader will find, in ascertaining just what is Professor James' latest, not to say, his final, view upon several difficult and disputed questions. The author's own mental evolution in dealing with the problems of psychology is displayed, to a remarkable degree, upon the pages of his book. He takes us, in a very captivating way, both into the slower growth and into the explosive struggles of his own emotional as well as intellectual experience with respect to all these problems. We are often prevented, however, from being able to follow the order of this evolution because we are not sure that it corresponds to the order of the chapters.

The learning displayed by Professor James is admirable. The numerous references and citations which his volumes contain never have the appearance of being dragged incontinently forward; they come spontaneously from a real fulness of resource which is the result of years of serious and varied reading. Nor can it be said that he has neglected any school, or branch, of psychological science, however remotely separated from the authorities which he values most highly. On the contrary, the gross bulk of the book is considerably increased by lengthy verbatim citations from many writers; though the wisdom of just such, and so lengthy, citations is by no means always obvious.

Different readers will differ greatly in their estimate of the spirit, temper, and taste or practical judgment, with which these volumes discuss debated questions in psychology. The discussion is throughout intensely personal. Each reader's estimate will probably therefore depend upon whether he has, or has not, a personal acquaintance with the author. Those who have not this acquaintance may mistake the real *animus* with which their favorite writers or cherished opinions are treated by Professor James. Admirers of Herbart, for example, or even those who recognize the Herbartian psychology as one of the most fruitful

of all modern movements in this science (the most fruitful, with, perhaps, the sole exception of that which is referred to Beneke), will scarcely approve of such phrases as "the hideously fabulous performances of the Herbartian *Vorstellungen*" (II, p. 585); "hideous . . . glib Herbartian jargon" (I, p. 603), *etc.*

It is also doubtful whether so-called neo-Kantians will feel a warm sympathy with an author who ascribes "wanton assumption," "a thoroughly mythological position," to Kant; and who speaks of the view which cannot discover the origin of "space-intuitions" in the primitive sensation-complexes, as "Kantian machine-shop." That admirers of Herbert Spencer will not relish having his most elaborate theories pronounced "vagueness incarnate," "scandalous vagueness," "chromo-philosophy" (I, p. 149), "trade upon his reader's lack of discernment," the result of his being "bound to pretend," "beneath criticism" (II, p. 576), *etc.*, scarcely requires to be said. The list of names, both well known and less known, to whom similar tributes are paid by these volumes is by no means a brief one.

On the other hand, personal acquaintances of the author will understand that this somewhat too free, and even loose, way of treating the opinions of others is not to be interpreted as indicating malice, prejudice, or lack of generous appreciation of fellow-workmen. They will rightly interpret it as native exuberance of interest in all the possible phases of all psychological problems. At worst, it is the irresistible but kindly disposition to hit a head wherever one is visible. And those who attend the fair should not feel irritated if they, or their dear friends, are among its temporary victims — so interesting and stimulating is the display of psychological wares and the distribution of the prizes.

Of the question of style we are interested to speak, only as it bears upon the more important questions of interpretation and of criticism. In fact, Professor James' style is such as necessarily to provoke criticism, favorable or unfavorable; but it is also such as to make calm and satisfactory criticism particularly difficult. One is constantly tempted to exclaim: Brilliantly and captivantly said; yet I am not sure whether you mean *exactly* this,

and not rather something else which I must proceed to say for you!

Nor is interpretation always easy. The distinctions, as they are left expressed by Professor James, are not infrequently too clear-cut, if I may so say. They are made in rather too highly colored, or too coarse and heavy, lines. Thus the scientific principle of continuity seems violated,—doubtless, often, where it would no longer seem to be, if we felt at liberty to disregard the first intent and inevitable effect of the author's language. Nature and reality, we are forced to maintain, nowhere draw such plain lines. In the chapter on "The Mind-Stuff Theory," for example, the author appears to deny all differences in the complexity of mental states as recognizably dependent upon multiplicity of factors, or upon degrees of clearness, in the field of consciousness.

The fuller significance of such general remark upon the character of these volumes will become more obvious as we subject to discussion the view they maintain regarding the nature and method of psychological science. What, then, does Professor James understand psychology to be; and how does he propose to give to his own psychological opinions the character of a science? The answer to this twofold inquiry will introduce another closely connected: What does he conceive to be the relation between metaphysics and psychology as a "natural science"?

Professor James is not in sympathy with the somewhat finical objection of Dr. Ward, who, as is well known, denies that we can define the field of psychological science as we can that belonging to any one of the particular sciences of nature. In the opening sentence of these volumes we are told: "Psychology is the Science of Mental Life, both of its phenomena and of their conditions." What are the phenomena of mental life, we are at once further informed; they are so-called "feelings, desires, cognitions, reasonings, decisions, and the like." If we are disposed, in the interests of convenience, to seek for some common term applicable to all such phenomena, "states of consciousness," or "mental states," is the term ordinarily adopted.

"Psychoses" has been proposed by Mr. Huxley. But Professor James would substitute for the ordinary term the less "cumbersome" expressions, "feeling or thought" (I, p. 185, f.). This use of language is, indeed, somewhat of a return to the nomenclature of the seventeenth century (to Descartes with his *cogito* as the equivalent of all truly mental phenomena). It has, moreover, the disadvantage of compelling the author himself constantly to vacillate between the more general and the more particular meanings of the words. We might even suspect that it is one cause of the extraordinary way in which the unity of each "thought" (that is, "field of consciousness," no matter how highly elaborate and complex) is insisted upon, to the prejudice and neglect of careful analysis of the many elements, or factors, that may enter into the constitution of that "thought."

Still, it is not difficult to understand this delimitation, by "first intention," of the field of psychological science. Its phenomena are the states of consciousness (or "thoughts") of the individual, as such;—that is, as *states of consciousness*. The science is to be both descriptive and explanatory; for it is both "of the phenomena, and of their conditions."

Further examination, however, of the author's conception of psychology as a natural science results in a most astonishing abbreviation of the rights of the psychologist. The treatment is to be explanatory, as a matter of course; it is to discover and reduce to order the conditions of the phenomena of mental life; otherwise, it would not be *science*. For Professor James holds, as we all do, that the "old psychology" was relatively lacking in scientific quality. It described and classified; but it did not explain, by pointing out, and reducing to general terms, the concomitant and antecedent conditions of the phenomena. How greatly disappointed we are, therefore, when an advocate of the new "natural science" of psychology restricts all legitimate explanation, by his very conception of such science, to one class of conditions only,—and these by far the most obscure and unattainable of all.

In his Preface, and in several other places, Professor James makes a gallant attempt to defend psychology as a purely natural

science by excluding from it all metaphysical assumption whatsoever. And since "all attempts to *explain* our phenomenally given thoughts" (that is, the whole sphere of descriptive psychology) "as products of deeper-lying entities are metaphysical" (p. vi), the explanatory office of the science cannot legitimately make use of even the postulate of a "soul," or — what is more surprising still — of any "Elementary Units of Consciousness." For, according to the author, "metaphysics fragmentary, irresponsible, and half-awake, and unconscious that she is metaphysical, spoils two good things when she injects herself into a natural science."

Now as to the explanatory value of the metaphysical postulate of a soul, I reserve for later pages of this article my contention with Professor James. For I differ decidedly from his opinion — at least as expressed in this passage. However, I take courage and hope for a nearer approach to a common view, upon discovering elsewhere the following utterance: "I confess, therefore, that to posit a soul influenced in some mysterious way" (why more "mysterious" than all so-called influence?) "by the brain-states and responding to them by conscious affections of its own, seems to me the line of least logical resistance, so far as we yet have attained" (I, p. 181). But is not "the line of least logical resistance" the line of most logical momentum, or — in other words — the line that marks out the best explanatory postulate of a metaphysical kind?

One can scarcely find fault, however, with Professor James for excessive parsimony in the matter of metaphysics, considering that his intention, avowed and repeated, is to treat of psychology purely as a natural science. On the contrary, the entire first half of the first volume seems to me far too metaphysical for the preliminaries of a scientific treatise; while a vast amount of conjectural metaphysics of physics is woven into the very texture of both volumes. Indeed, on the page of the Preface already referred to (p. vi) we are told that psychology assumes as one of its data, "a *physical world* in time and space with which they (*i.e.* the phenomena of psychology, the thoughts and feelings of individual minds) coexist, and which *they know*."

But psychology as a science, devoid of all postulating of "deeper-lying entities," does nothing of the kind. It assumes only the phenomena—the thoughts and feelings as actually known, and the possibility of ascertaining uniform relations among them. Any departure from this position is a resort to metaphysics; for it necessarily involves an appeal to "deeper-lying entities." But the entity called mind lies no deeper than the entity called brain; the postulated being which is to serve as the subject of thoughts and feelings, and so to explain them, is no more "cantankerously" or dangerously metaphysical than the being which is to serve as the subject of conjectural "explosions," "central adjustments," "overlappings" of processes, *etc.*

Of course, that particular portion of the physical world, in time and space coexistent with thoughts and feelings and *known* by them, which Professor James especially needs as *datum* for his science of psychology, is the human cerebrum. For, according to his conception of this science, no other "conditions" but the processes accomplished in this cerebrum, "explain" the existence of thoughts and feelings. Accordingly, the cerebrum is sometimes spoken of as though it "throws off," as a sort of total epi-phenomenon incapable of being analyzed into psychic factors or explained by reference to antecedent psychic conditions, each state of consciousness. With our author, psychology as a natural science, without metaphysics, is wholly cerebral psychology. "A blank unmediated correspondence, term for term, of the succession of states of consciousness with the succession of total brain-processes"—this is the last word of a scientific psychology, that will be clear and avoid all unsafe metaphysical hypotheses (I, p. 182).

We now have Professor James' conception of the explanatory work of psychology limited to its narrowest terms. Let it be noted that this conception excludes, as explanatory science, not only all introspective psychology, as such, but also almost the entire domain of what is customarily known as physiological psychology. All of the immense labors of Weber and Fechner, and of their pupils, in the effort to establish the law which goes by their great names, all of the most admirable treatises, like

Helmholtz's *Physiologische Optik* and *Tonempfindungen*, nearly all (indeed all, but the worthless conjectural part) of the monographs on psychometry, must — if we adhere strictly to this definition — be ruled out of the domain of scientific psychology. To be sure, these treatises establish uniform relations between thoughts and feelings, as such, and observed facts of the application of stimuli to the *periphery* of the human body. But they are too far from the sacred centre, where the "explosions" and the "overlappings," and the "central adjustments" take place, to be entitled to the name, "natural science," in the highest meaning of the phrase. Or, at least, their value is to be estimated by the inducement they afford the psychologist to frame diagrammatic, or verbal, representations of precisely what it is, in which such "explosions," "adjustments," and "overlappings" consist.

Let it not be supposed that Professor James himself remains faithful to this extremely contracted conception of psychology as a natural science. On the contrary, by far the larger and better portions of his two large volumes are those, where he feels irresistibly impelled to introduce some metaphysics, or to leave out nearly all the conjectural cerebral physiology. For example, the chapters in the second volume which treat of Perception by the Senses are, from the scientific point of view, much the most valuable part of the entire work. Here the author is at his best. He introduces freely his wide acquaintance with modern analytic and experimental psychology. His descriptive science is here — as everywhere — admirable. He indulges, but not immoderately, in speculation — not omitting all help from semi-metaphysical assumptions. And, above all, the amount of cerebral physiology, which is introduced to explain the rise and change of the states of consciousness, is relatively so small that it really is not worth taking into the account.

The attempt to establish psychology as a natural science upon such an extremely tenuous and cloudy foundation as our present or prospective knowledge of cerebral "explosions" and "overlappings" is doomed to failure from the very begin-

ning. It is probably due to this attempt that we so frequently find Professor James holding up to ridicule all the different forms of metaphysical hypothesis. It is perhaps due to the consciousness of failure that so much of metaphysics is — albeit in a somewhat clandestine manner — freely introduced. On the one hand, the “mind-stuff theory,” and the theory of associated psychic factors, as well as the views of Wundt and Helmholtz respecting the need of “psychic synthesis,” are rather flippantly set aside as too metaphysical. The ontology of “spiritualistic philosophy” is sometimes (*e.g.* I, p. 500 f.) caricatured rather than fairly criticised. But, on the other hand, we find Professor James inclined deliberately to admit, and actually making his theory dependent upon, not a few metaphysical postulates of his own.

Similar reasons may explain the attitude of these volumes, already noticed, toward a large part of modern empirical psychology. Obviously the author, while writing on psychology as a natural science, is “*bored*” (I, p. 192) by so much minute analysis, painstaking collection of statistics, and disproportionate meagreness of scientific results. His discussion of Fechner’s law closes (I, p. 549) with the humorous declaration: “It would be terrible if even such a dear old man as this could saddle our science forever with his patient whimsies, and, in a world so full of more nutritious objects of attention, compel all future students to plough through the difficulties, not only of his own works, but of the still drier ones written in his refutation.” We have already seen how the elaborate attempts of writers like Herbart and Spencer, to build up an account of complex states of consciousness out of different elementary psychic factors, impresses Professor James.

But what, let us inquire, are we to substitute for this patient work of analysis in our effort to render psychology a science of the order called “natural”? Professor James, *so far as he remains true to his own conception of psychology*, can only answer with two chapters on “The Functions of the Brain” and “On some General Conditions of the Brain-Activity,” and with various exceedingly thin and dubious diagrammatic repre-

sentations of brain-processes occasionally interjected into the discussion of psychological phenomena.

Let me, then, at once speak frankly and clearly. The conception of psychology as a natural science with which Professor James sets out, is — in my judgment — a wholly untenable conception. To adopt it is to confess the impossibility of giving any truly scientific character to psychology. The author does not himself adhere to it. Moreover, he does precisely what all who adopt the same conception find themselves compelled to do; he becomes metaphysical. He postulates some of those abhorred "deeper-lying entities"; and then he puts them through a course of conjectural processes in order to explain other (conscious) processes which are not conjectural, but are indubitably known to exist.

It is, indeed, conceivable that, at some time in the future, a small branch, or twig, of scientific psychology to be called the "cerebral," may be established. It will always be peculiarly difficult, however, to keep that set of explanatory conditions, which lies in the cerebral hemispheres, free from metaphysical postulates. The way to the establishment of any *science* of cerebral psychology is long and thorny and dangerous. It is as yet scarcely open to even the boldest flight of imagination; there will be, in the best estate of cerebral psychology in the future, few who will actually tread, with assurance and safety, *terra firma* in this path.

What then would be necessary to establish psychology as a natural science after the pattern of Professor James' conception of it? A comprehensive scientific grasp on two related orders of phenomena? They are the "thoughts and feelings," that are the phenomena with which, primarily, psychology deals; and, also, the "brain-processes," — and these, with that exactness, certainty, and detail of information, which makes the knowledge of phenomena worthy to be called science. The "thoughts and feelings" we do both know and know about, in a truly scientific way. We can describe them, as Professor James frequently does in such brilliant and interesting fashion. Moreover, we can explain them, by reference to their elements and

conditions as existing in other antecedent and concomitant thoughts and feelings. But of their conditions, as existing in the shape of antecedent or concomitant brain-processes, we have no knowledge worthy of being called *science*. Exner's declaration is almost as true to-day as it was several years ago, when he made it. "There is no science of cerebral physiology." If, then, it is necessary, laying aside all metaphysical postulating of deeper-lying (psychical) entities, in order to render psychology a natural science, that we should scientifically know the cerebral conditions of our thoughts and feelings, and should bring under terms of exact formulæ the relations of the latter to the former, we must at once abandon all pretence of scientific character for psychology. If cerebral psychology is the only scientific psychology, then there is no science of psychology.

There are two directions in which modern attempts make progress in laying the foundations of cerebral physiology. One of these is the localization of cerebral function, the other is so-called "nerve-physiology," as modified and complicated by the exceedingly obscure and complex molecular structure of the cerebral substance. The former of these investigations aims to discover *where* something takes place, which is somehow related to certain changes of our "thoughts and feelings"; — or rather, so far as yet appears, chiefly (perhaps exclusively) to changes in our sensory-motor mental life. The latter aims to describe precisely *what* it is that takes place, whenever a so-called "cerebral process" occurs in uniform relation to these changes of thoughts and feelings. One inquiry admits, in part, of experimental testing; it has made rapid and brilliant progress since the epoch-making experiments of Fritsch and Hitzig in 1870. The other inquiry — the investigation which, if it succeeded, would tell us, *in terms of molecular science*, the precise nature of brain-processes related to thoughts and feelings, and precisely how they change, if at all, in character, as the related thoughts and feelings change — is in a hopeless muddle still. Not all the physiologists in the world can say "in terms of molecular science," what is done by the sciatic nerve of a frog, with the gastro-

cnemius muscle attached, when it is stimulated by the electrical current. And as to a science of nerve-physiology, which shall apply with any accuracy of detail to the variety of cerebral processes concerned in human thoughts and feelings — well, it is hard to measure our present remoteness from such a science.

I have already said that Professor James furnishes only two short chapters, which even attempt a summary of the results of modern investigation respecting those "conditions" of mental phenomena which, according to his conception, are the only conditions admitting of scientific treatment. His chapter "On the Functions of the Brain" is on the whole excellent. It is written with fulness of information brought well down to the present time. Yet it contains statements which would by no means command universal acceptance by expert students of the subject. For example, it will scarcely do to say that Broca's convolution is the seat of injury, without exception, in all cases of pure motor aphasia (I, p. 38 f.). The conclusion of the present state of knowledge on the general subject is, that we are fairly certain what parts of the cerebral hemispheres are somehow concerned in the intelligent management of the limbs; less certain, what have to do with "psychical vision"; less certain still, precisely what and how many have to do with the expression and interpretation of spoken or written language; and very uncertain as to where are the so-called "centres" of the other sensory-motor forms of mental life. But as to the localization of any of the "higher" forms or factors of thoughts and feelings, we are almost totally in the dark. Nor should we know what to do with *such* centres, if we could succeed in getting any clear trace of their existence.

Nevertheless, in the direction of locating centres, cerebral physiology is making rapid and real progress. It seems strange, therefore, that Professor James makes little or no attempt to work out in detail a theory of the empirical conditions of the phenomena of mental life, on the basis of this chapter. Why does he not tell us, for example, *precisely in what cerebral centres* the consciousness of self, the perception of time, the perception of space, the instinctive beliefs, and the necessary truths, have

their "blank unmediated correspondences, term for term"? Is it because he knows quite well that the chances are against any such attempt at scientific precision remaining uncontradicted by empirical data for a period of three successive years?

The chapter on "General Conditions of Brain-Activity" is unexpectedly meagre for a writer who proposes to treat psychology as a natural science, without metaphysics, and from a point of view which finds the ascertainable conditions of psychological phenomena solely in brain-processes. What is the nature of these processes? And how do they change, not simply in locality but in character, as the thoughts and feelings change, of which the processes are the conditions? I have already said that modern science cannot answer this question. But Professor James seems to have done far less for this subject than he might easily have done. For, surely, here is *the* part of physiological psychology in which we might reasonably expect him to be especially interested. His contribution to the department of cerebral psychology in these volumes consists very largely of simple schematizing. The inadequacy of the method is confessed. In a note to the first page of this chapter (I, p. 81), we read: "I shall myself in later places indulge in much of this schematizing. The reader will understand once for all that it is symbolic; and that the use of it is hardly more than to show what a deep congruity there is between mental processes and mechanical processes of *some* kind, not necessarily of the exact kind portrayed."

On the confession made in the note just quoted, the following remarks seem to me in place. All such schematizing is, of course, "symbolic"; but what it symbolizes is not at all what Professor James would have the reader suppose. Such schematizing can only symbolize certain conjectural relations between places where the nerve-processes take place. It contributes nothing toward symbolizing the nature of the nerve-processes themselves. These processes do not admit of any such symbolical representation. Much less does it serve even to suggest those possible changes in the character of the processes, by virtue of which they become conditions of different and varied

thoughts and feelings. We are nowhere, so far as I can discover, even told whether their author supposes that changes in *centres* of the processes — "overlappings," and "discharges" — are the only changes which condition changes in mental phenomena ; or whether it is also changes in the *processes themselves* which constitute, in part, the necessary cerebral conditions of mental changes. The diagrams and language, in general, imply the former position. Is, then, no real science of nerve-physiology, as a part of molecular theory, necessary in order to have a psychology worthy to be dignified with the name of "natural science" ?

In one place at least, however, Professor James implies that the brain-processes to which, in this "blank unmediated" fashion, the thoughts and feelings correspond, may differ in kind and not simply in locality and intensity (I, p. 566 f.). Well then, what we wish to have in the name of cerebral psychology, is a description, in terms of a comprehensible theory of molecular physics, what these differences are ; and, also, a statement of the formulæ which define the relations between the molecular changes and the "corresponding" orders of mental phenomena. But this is precisely what Professor James avoids doing, even to the extent which so-called "nerve-physiology" makes possible. And, as I have already repeatedly said, nothing worthy of the name "science" *is* possible for any one in this branch of cerebral psychophysics.

When, then, Professor James maintains that his oral or schematic descriptions of the brain-processes, which correspond "in a blank unmediated way" to thoughts and feelings, "show what a deep congruity there is between mental processes and mechanical processes of *some* kind" ; I must beg his pardon and flatly contradict him. They show nothing of the sort ; they *show* nothing of any sort. They assume some sort of unknown congruity ; they also serve to impress the uninitiated reader with the feeling that he is being shown something.

But only exact and verifiable description of what, and where, are the processes to which the particular factors and classes of the conscious states correspond can be called science. The

question is precisely what kinds of changing molecular processes — thermic, electrical, chemical, vital, *etc.* — take place, and in what related convolutions and parts of convolutions, corresponding to all the changes in conscious thoughts and feelings. To make any advance toward answering this question, “nerve-physiology” and the “localization of cerebral function” must go cautiously hand in hand. But the assumption of the congruity is in no wise dependent upon the advance of science. It was made by Spinoza as rigidly as it can be made by any one. Yet we are almost infinitely farther off to-day than his contemporaries seemed to themselves to be, from a satisfactory scientific knowledge of this congruity, without any metaphysical assumptions whatsoever.

Of the conception of psychology, its nature, problems, and method, which is proposed in these volumes, and of the defence in detail of this conception, the following statements seem to me true: The conception is such, and so narrow, that a consistent adherence to it compels us to admit the utter impossibility of establishing psychology as a natural science. It excludes almost all the really scientific data and conclusions; it includes only those data and conjectures which are most remote from genuine science. But the author does not adhere to this conception. Neither does he adhere to his determination to exclude metaphysics. The metaphysics of mind is often admitted, with confession of apparent inconsistency; the metaphysics of physics is freely admitted, generally without confession or apparent consciousness of inconsistency. As descriptive science, the work is admirable; for its author is a born, and a thoroughly trained, psychologist. As explanatory science also, — wherever it departs most widely from its own conception — it is generally admirable. As explanatory science, without metaphysics, in the form of the aforesaid “blank unmediated correspondences,” it is, at best, *not science at all*.

These general conclusions I shall now briefly test by application to two or three particular problems. And, first of all, let us inquire how Professor James solves, by his method, the problem of “the consciousness of self” (chap. x). Preceding the chapter devoted to the “finer work” of tracing the psychology of

the fact of self-consciousness, the "stream of thought" has been described. We are now told how a certain "fluctuating material" is built up into a variety of empirical selves which stand more or less remote from that *ego*, which psychology generally recognizes as somehow, in the evolution of experience, set over against a *non-ego* — that which is *I* and is not even *my* body. But, according to the author, the essential core of every known self is the distinct feeling of some bodily process. And the "Self of selves, when carefully examined, is found to consist mainly of the collection of these peculiar motions in the head or between the head and throat"; — this, at least, is what Professor James finds true in his own case (I, p. 301 f.). And, in more general terms, with some persons at least, the "part of the innermost Self which is most vividly felt turns out to consist for the most part of a collection of cephalic movements of 'adjustments' which, for want of attention and reflection, usually fail to be perceived and classed as what they are." It is admitted here, however, "that over and above these there is an obscurer feeling of something more"; and this may be of "fainter physiological processes," or it may be of "nothing objective at all" (p. 305).

With such remarks as those just quoted, the real problem of self-consciousness is dismissed for some pages; it is resumed later as a discussion of the three theories (spiritualist, associationist, transcendentalist) concerning the "pure self or inner principle of personal identity." Each of these three theories is taken up, criticised, and rejected. The theory of a soul to which, as subject, the thoughts and feelings belong, is held to be "needless for expressing the actual subjective phenomena of consciousness as they appear" (p. 344). But — by the way, I remark — the theory of a brain does not appear to be needless. Says Professor James: the "bald fact is that when the *brain acts*, a *thought occurs*." Not at all: we must either say — and adhere to it — the truth demanded by all the science is that, when the brain acts, the mind acts; or else we must say: when such and such a known cerebral phenomenon occurs then such and such a corresponding thought or feeling occurs.

But the problem of self-consciousness is not one of "blank unmediated correspondences" between certain series of *particular* thoughts and other series of particular known brain-processes. It is the far graver and profounder problem of trying to tell how there comes to be an actual distinction made between thoughts and thinker; and how some thoughts are irresistibly referred by the thinker to the thinker as, not himself, but *his* thoughts; while other thoughts are referred by the same thinker to things as knowledge which the same thinker has of what *is not* his thoughts. Just here Professor James leaves us, totally without any explanation even of his own inadequate statement of the content of this problem. We have no explanation even of this aforesaid "obscurer feeling of something more," which may not be a feeling of "fainter physiological processes," but may be of just "nothing objective at all"?

The scientific description and explanation of the problem of self-consciousness includes that unity which is the very core of the problem itself. The insignificance which Professor James attributes to this problem he justifies by an appeal to Lotze, who is represented as maintaining that, "so long as our self, on the whole, makes itself good and practically maintains itself as a closed individual," this is enough. The appeal to Lotze is here most unfortunate. For above all philosophers of the century he has maintained that to be "substantially" and to be self-conscious is one and the same thing; and that the unity of self-consciousness is an irresistible demonstration of the real being of the soul.

The "associationist theory" of the pure self is then held to be—as no doubt it is—quite unworkable without secretly summoning to its help some unifying principle, some psychic synthesis, or postulated "deeper-lying entity." While "transcendentalism is only substantialism grown shame-faced, and its Ego only a 'cheap and nasty' edition of the soul" (p. 365). The conclusion of the whole matter is, then; scientific psychology, abjuring metaphysics, must hold that "*thought is itself the thinker*, and psychology need not look beyond" (p. 401).

But we are inclined to insist yet again: The very problem to

be solved is how the thought of one thinker, *whose* are all the thoughts, but who *is not* merely the sum-total of these thoughts, can arise; and what is implicated in such a peculiar form of thought. In other words, the problem is the problem of self-consciousness; and we want Professor James to solve it in accordance with his conception of his duty as a teacher of the "natural science" of psychology. This, we have seen, requires him to reject all metaphysical postulates, whether of a substantial soul, or of a psychic synthesis, or of elementary units of consciousness; and to tell us precisely what brain-processes correspond, in a "black unmediated" way, to this peculiar thought.

It is characteristic of the way in which the conception of psychology as a natural science is here carried out to find Professor James heartily commending Mr. D. G. Thompson for the following position: "All states of consciousness imply and postulate a subject Ego, whose substance is unknown and unknowable, to which states of consciousness are referred as attributes, but which in the process of reference becomes objectified and becomes itself an attribute of a subject Ego which lies still beyond, and which ever eludes cognition though ever postulated for cognition" (p. 355). Now we should suppose that our author would rebuke this ponderous sentence as containing an exceedingly sweeping metaphysical postulate, and, moreover, a transcendental Ego, or "cheap and nasty edition" (second edition?) of a soul; and also as being, "vagueness incarnate," because it speaks of "unknowable substance" that has plenty of attributes (by which, we suppose, all substances are known), and of cognized realities that "ever elude cognition." But No! Professor James actually maintains of Mr. Thompson's postulated unknowable entity called Ego: "This is our judging and remembering present 'thought,' described in less simple terms." And is a "judging and remembering present Thought,"—if only you spell it with a capital as Mr. Spencer spells his Unknowable—capable of all this? Well, then, we now understand the problem of self-consciousness; but the mystery of such a "Thought" is great. However, we forbear; for when

Professor James falls upon the neck of a disciple of Herbert Spencer, and is reconciled to what he is himself pleased to call "Chromo-philosophy," the presence of a third party upon the scene is simply profane.

Passage after passage might be quoted in illustration of the author's confession that the bed which he so carefully prepares is too narrow to give a comfortable repose to the facts which he admits. This is strikingly true in the account which is given of the nature of the fact of knowledge. We are told, in general (I, p. 197), that psychology only "assumes that thoughts successively occur and that they (the thoughts) know objects in a world which the psychologist also knows." But how thoughts can *know* "objects in a world"; and in what respect the psychologist's knowledge of this world differs from the knowledge of the objects, in this world, by his thoughts; and how the knowledge of the psychologist is going to be identified by himself with the knowledge of the objects by the psychologist's thoughts;—we find it difficult to understand as a matter of cerebral psychology. Professor James makes, on this point, little or no attempt to assist us. For in the chapter on "The Stream of Thought," in stating what is implicated in the primary fact that "*thinking of some sort goes on*," he takes the most pronounced spiritualistic positions. "Every thought," says he (p. 225 f.), "tends to be part of a personal consciousness." And now the elementary psychic fact appears to be,—"not, *thought* or *this thought*, or *that thought*, but *my thought*, every thought being *owned*." The "immediate datum of psychology," "the universal conscious fact," is no longer "feelings and thoughts exist, but I think, and I feel." This "I," moreover, necessitates some sort of a continuity of mental life, permanency of being, or—at any rate—conscious identification of past and present as alike belonging to "Me." "Within each personal consciousness, thought is sensibly continuous" (p. 237). But knowledge is of Things; and "human thought appears to deal with objects independent of itself; that is, it is cognitive, or possesses the function of knowing" (p. 271). But *it* (the stream of consciousness, or better the "Thought," spelled with a capital) "is always inter-

ested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks."

Now, in what respect a Thought which "welcomes and rejects, or chooses, all the while it thinks," and always tends to understand itself as a part of a personal consciousness, and deals with objects independent of itself, involves fewer necessities of metaphysical postulating than does the mind, or soul, which is with Helmholtz and Wundt an actual energy of psychic synthesizing, I am quite unable to see. But I am yet more unable to see any satisfactory account in these volumes of the precise brain-processes with which many of these profound functions of such a "Thought" correspond. Perhaps the nearest approach to such an account is to be found in the treatment of Memory; and to this treatment we now briefly turn our attention.

Of all the so-called faculties of mind, or factors and functions of psychic life, memory seems most readily to admit of a purely cerebral explanation. Without memory, of course, the consciousness of self and the cognition of things are impossible. It does not follow, however, that, if psychology as a natural science in the sense which Professor James attaches to the words could solve the problem of memory, it could, therefore, solve also the problems of self-consciousness and sense-perception.

With characteristic honesty and thoroughness and acuteness of analysis, Professor James describes what is involved in an act of memory, in the highest, most *spiritual* — if I may be pardoned the word — use of this faculty. It is emphatically said (I, p. 649 f.) that "the revival of an image" is not, as many writers (*e.g.* Spencer, *etc.*) suppose, all that is needed to constitute the memory of an actual occurrence. "No memory is involved in the mere fact of recurrence." Besides this mere fact of recurrence, the condition of memory is that "the fact imaged be *expressly referred to the past*, thought as *in the past*." "But even this would not be memory. Memory requires more than mere dating of a fact in the past. It must be dated in *my past*."

In other words, Professor James' descriptive science admits that memory, in the highest form of its exercise, involves something more than mere retention and reproduction. It involves

conscious recognition of the continuity of a psychic life-history, the referring of the fact represented, as an experience, to the same subject whose is the representative image, — in the unity of one time. But when he proceeds to explanatory science, and lays bare the causes of this mysterious phenomenon, it is only the fact of recurrence which comes in for any adequate share in the account. At the close of his discussion, a passage from a work of mine is cited at length ; which passage concludes as follows : “When, then, we speak of a physical basis of memory, recognition must be made of the complete inability of science to suggest any physical process which can be conceived of as correlated with that peculiar and mysterious *actus* of the mind, connecting its present and its past, which constitutes the essence of memory.”

This conclusion of mine Professor James considers “characteristic of the reigning half-way modes of thought” (I, p. 688). And he inquires : “Why not ‘pool’ our mysteries into one great mystery, the mystery that brain-processes occasion knowledge at all?” In reply I might say that “pooling” is not, in my judgment, precisely the most satisfactory way of settling controverted questions in psychology. And whether the view advocated by my book be a “half-way mode” of thinking, or not, it is certainly designed in the interests of a more thorough analysis than my critic furnishes. The general mystery (the “pool,” into which all psychological mysteries may be conveniently dumped) of “blank unmediated correspondences” between brain-processes and thoughts and feelings, that are *of* no mind and require no metaphysical postulate of even a psychic unifying energy, is as great to me as it possibly can be to Professor James. But in memory, as, indeed, in all the particular problems of psychology, I find abundant tokens that his view of psychology as a natural science is totally inadequate to suggest — not to say actually to furnish — any precise explanation of the most important facts of psychic life.

I agree with Professor James in finding evidence of a “blank unmediated correspondence” between facts of the recurrence of brain-states and facts of the recurrence of particular mental

images. But this correspondence *explains* — so far as it explains anything — only the facts of recurrence. How, now, about those other facts, — the facts, namely, that the thing or event imaged is "expressly referred to *the past*," and the fact that it is "dated in *my past*"? These facts are not satisfactorily explained, to my thinking, when you simply say: Let us "pool" the mystery, and just tumble into the "pool" the word "consciousness," as a kind of insignificant surplusage to so-called "organic" or "cerebral" memory. Nay: for it is precisely *these*, and no other, psychic mysteries — the mysteries of the reference of a present state to *a past* that is *my past* — for which we are seeking an explanation.

And if you will only give Professor James time enough, and take the pains to piece together what he admits and claims in other connections, and not hold him strictly to his favorite topic of cerebral psychology, and will welcome certain "shame-faced" metaphysical postulates, you will find him giving a very fair account of this special problem of memory. Here I will venture to bring together some of the numerous passages in which side-lights are thrown on this problem. "There *are* categories," says he (I, p. 147, note), "common to the two worlds. Not only temporal succession, but such attributes as intensity, volume, simplicity or complication, smooth or impeded change, rest or agitation, are habitually predicated of both physical facts and mental facts. Where such analogies obtain the things do have something in common." Yes: but it is also implied that there *are* categories which are *not* common to the two worlds. What analogy, what thing in common, is there between the fact of the recurrence of an analogous brain-state and the fact, not simply that the corresponding mental state recurs, but that I refer this present state to a *past* fact, and set it in the past as *my past*?

How, moreover, shall a writer object to speaking of some psychic synthesis as involved in memory, who has himself maintained (p. 158): "All the combinations which we actually know are effects, wrought by the units said to be combined, upon some entity other than themselves." "No possible number of

entities" (facts, forces, *etc.*) "can sum *themselves* together." In another place (p. 161): "This argument of the spiritualists . . . holds good against any talk . . . which supposes a resultant consciousness to float off from the constituents *per se*, in the absence of a supernumerary principle of consciousness which they may affect." In yet another place (p. 331 f.): "This sort of *bringing of things together into the object of a single judgment* is of course essential to all thinking. . . . The thinking them is *thinking* them together, even if only with the result of judging that they do not *belong* together." This sort of "subjective synthesis" is declared "essential to knowledge as such"; and, if so, certainly to that peculiar form of knowledge which we have just seen described as *memory*, in the highest sense of the word. Nay: "The subjective synthesis is involved in thought's mere existence"; and only as we assume such synthesis can even a really disconnected world be *known* to be such.

In a note (p. 578) to the discussion of "association by similarity" we are told, "impartial redintegration connates neural processes," but "similarity is an objective relation perceived by the mind." Right in connection with the attempt to deal with this subject as a matter of "blank unmediated correspondences" between brain-processes and thoughts and feelings, an appeal is taken to some future day when "possibly" the science of nerve-physiology will clear the matter up; but here the significant confession is added: "Possibly neural laws will not suffice, and we shall need to invoke a dynamic reaction of the form of consciousness upon its content." I conceive this to be not only "possibly" so, for that indefinite future when the failure of cerebral psychology shall be made obvious to all, but also altogether and certainly so, for the immediate and necessitous present of psychological science. Indeed, it is in the study of these so-called "dynamic reactions of the form of consciousness upon its content" that a large part of scientific psychology must always consist.

If further proof were needed of the keen and comprehensive insight of Professor James into the inadequacy of his own avowed conception of psychology as a natural science, it might

be found in such passages as follow: "The similarity of two things does not exist till both things are there — it is meaningless to talk of it as an *agent of production* of anything, whether in the physical or the psychical realms. It is a relation which the mind perceives after the fact," *etc.* (p. 591). And returning to the peculiar form of knowledge called memory, we quote these words: "The clock strikes to-day; it struck yesterday; and may strike a million times ere it wears out. . . . But does the present clock-stroke become aware of the past ones, . . . because it repeats and resembles them? Assuredly not. And let it not be said that this is because clock-strokes . . . are physical and not psychical objects; for psychical objects (sensations for example) simply recurring in successive editions will remember each other *on that account* no more than clock-strokes do. No memory is involved in the mere fact of recurrence. . . . A farther condition is required before the present image can be held to stand for a *past original*" (p. 650 f.).

It would be difficult to find in any work on psychology a more clear and emphatic avowal, that "blank unmediated correspondences" between recurrent brain-processes and recurrent thoughts and feelings furnish no adequate explanation of the admitted facts and elements of every act of self-conscious re-cognitive memory. Moreover, there are few writers on psychology that really introduce a more elaborate "machine-shop" of psychic syntheses, dynamic reactions of consciousness, welcoming and rejecting, selecting processes of a spiritual principle called "mind," than does Professor James. Surely, then, some of his own words when quoted must seem to their author "characteristic of the reigning half-way modes of thought." They certainly fail to "pool our mysteries," by the doubtful process of accounting for what is not conscious (and, therefore, according to Professor James, not mental) at all, and then just simply adding consciousness, "in the lump" as it were, so as to render the account adequate for the life of the mind.

I have already said that Professor James' treatment of Perception, or the form of knowledge which we call knowledge of Things, seems to me by far the best portion of his volumes. It

is the portion, however, in which he least allows himself to be guided by his fundamental conception of psychology as a natural science; it is also the portion in which he makes most use of his comprehensive learning and powers of acute analysis, on terms common to himself with all students of modern empirical psychology. To be sure, he starts the discussion with the very doubtful assumption, in which he agrees with Dr. Ward, that "extensity," or "bigness," and that in three dimensions, belongs to our most primitive sensation-states. And although he appears far better acquainted than Dr. Ward with the experimental data on which writers like Stumpf and Hering endeavor to place this view, he makes comparatively little use of these data. Their claims for "extensity" as a primitive quality of all sensations are almost wholly based upon an appeal to adult self-consciousness, — a form of appeal which I suppose nearly all expert writers regard as entirely irrelevant and inadequate. Certainly this appeal is no substitute for that minute analysis of the factors, and stages in growth, of the perceptive power of mind, in which Wundt and Helmholtz and many others have been so successful; and in which I have tried to take some small part. For the view, however, which regards "extensity" as an acquired quality of certain sensation-states, Professor James — in his customary off-hand way — declares (II, p. 31), "there is not a vestige of evidence." Moreover, the opinion with which it hangs together — namely, that our sensations are originally devoid of all spatial content — he confesses himself "wholly at a loss to understand." This seems a pity, because the opinion probably represents about nine-tenths, or at least four-fifths, of the most patient, intelligent, and elaborate work which the science of psychology has done upon the subject of perception by the senses, during the last quarter of a century.

We are not concerned at present, however, to discuss with Professor James his theory of "The Perception of Things." We wish only to remark in passing that almost all the points which are here treated, in any full and satisfactory way, avail themselves of the same inductive conclusions and meta-

physical assumptions as those shared in by all other students of psychology. But the author's attempts to bring this treatment into accord with his own conception of psychology as a natural science, by pointing out "blank unmediated correspondences" between brain-processes and intuitions and conceptions of space-qualities and space-relations is — so it seems to me — a complete failure. "Overlappings" in cerebral commotions, which shall be in *such* correspondence to our perceptions, cannot be pointed out; all the modern science of perception seems to me to indicate this. But if they could, I fear that a large number of thoughtful minds, afflicted — no doubt — with the incurable pest of an inclination to metaphysics, would still feel the need of retreat to some "Kantian machine-shop," or some place where "glib Herbartian jargon" is manufactured, or "cheap and nasty editions" of the soul are issued to deceive the unscientific.

I will speak of one point more, and that only very briefly. In his final chapter Professor James shows the most splendid courage of his convictions. Here he applies his view of psychology as a natural science to the explanation of the rise and binding authority of so-called "Necessary Truths — Effects of Experience." This title is extended (II, p. 629 f.) over seven kinds of "Elementary Mental Categories." Among these are all the instincts and ideas of worth, æsthetic ideas, as well as ideas of time, space, number, identity, causal dependence, and the fundamental laws of logic.

Mr. Spencer's attempt to account for the origin of so-called necessary truths according to principles of cerebral evolution is keenly criticised and promptly rejected by Professor James. Personally, the author has no objections to the terms "intuitive," "innate," or "*a priori*." "There is," says he (p. 661) "no denying the fact that *the mind is filled with necessary and eternal relations which it finds between certain of its ideal conceptions, and which form a determinate system, independent of the order of frequency in which experience may have associated the conception's originals in time and space.*" Yet this filling of the mind with "necessary and eternal relations" between "ideal conceptions,"

although it is independent of the frequency of experience, is a problem with which cerebral psychology may cope. The origin of the "necessary and eternal" Professor James finds in certain "random irradiations and re-settlements of our ideas, which *supervene upon experience*, and constitute our free mental play"; and these aforesaid changes in our thoughts and feelings "are due entirely to secondary internal processes, which vary enormously from brain to brain, even though the brain be exposed to exactly the same outer relations." Thus "the higher thought-processes owe their being to causes which correspond far more to the sourings and fermentations of dough . . . than to the manipulations by which these physical aggregates came to be compounded."

This substitute for Mr. Spencer's theory we leave to whatever fate it may have at the hands of cerebral physiology, when studied from the evolutionary point of view; but we have the very solemn and even pathetic feeling that somehow we have wandered far from the *science* of psychology. We sympathize, therefore, most deeply with the author as he closes this interesting chapter — which, by the way, will undoubtedly seem unsatisfactory to every school of psychological opinion — with the feeling that one "clearly perceives 'the slowly gathering twilight close in utter night.'"

Nevertheless, we do most confidently believe that modern psychology is amply entitled to be called a science; and even — if you please — "a natural science." It is a science, because it has a sufficiently well-defined field of phenomena, which it undertakes to describe and to explain; and because it has ample data, not only for description but also for explanation of these phenomena. All the states of consciousness, as such, constitute this field; they offer the problems to the psychologist. In the effort to solve these problems his science, like every other genuine inductive science, moves in two directions. It analyzes what is relatively very complex into what is relatively simple and elementary; and it points out the conditions under which, and the terms — so to speak — on which the latter combine into the former. Of course, in doing this the psychologist must not

be deceived into supposing that these factors, or "*moments*" of psychic life, are entities, after the fashion of the atom, or molecule, dealt with by the natural sciences of chemistry and molecular physics. But they are entities in the sense in which psychic facts are entities. The existence of some of them can be readily detected by such analysis as self-consciousness can make; while others of them are rather speculative necessities postulated in the effort to account for the varying characteristics of those complex phenomena which constitute the primary problems of psychology.

But besides this explanation by analysis, the science of psychology has the task of tracing the evolution of mental life. The conception of evolution is as much needed, and as light-bringing, in the treatment of mental as of any other form of life. Here the natural sciences—in the strict sense of the word "natural"—may be evoked to tell of the physical conditions, under which the genesis and development of mental life takes place. But we make a very meagre, an unnecessarily meagre, use of the principle of development, if we fail to apply it directly to mental life itself. The life of consciousness falls directly under this principle. Its various stages are related to each other, under law, according to the conception which this principle emphasizes. When we point out uniform relations, the dependence of mental state on mental state, of one stage of mental life on other stages of mental life, we render psychology scientific. For the psychologist to surrender all right to claim that he "explains" psychic facts by tracing their causes in other antecedent and concomitant psychic facts—as Mr. Hodgson and Professor James appear ready to do—is to "sell his birthright for a mess of pottage." For a "mess of pottage," or little better, is the present content of cerebral physiology as explanatory—even to the extent of establishing "blank unmediated correspondences"—of the fundamental, as well as of the so-called higher, activities of mind.

But may we pursue psychology as a "natural science" without postulate of a soul, and without any metaphysical implicate or postulate whatsoever? Possibly: I am not prepared to say

that we cannot; but the way is straight and narrow and there are few, if any, who succeed in finding it. Formally to abjure all metaphysics, and then really to admit no end of doubtful metaphysics of physics—as Mr. Huxley and Dr. Maudsley, and so many others are constantly doing—is scarcely consistent with adherence to the principles of pure science. No one has pointed this out more clearly than Professor James. In a royal passage (I, p. 137) he declares: “As in the night all cats are gray, so in the darkness of metaphysical criticism all causes are obscure. But one has no right to pull the pall over the psychic half of the subject only, as the automatists do, and to say that *that* causation is unintelligible, whilst in the same breath one dogmatizes about *material* causation as if Hume, Kant, and Lotze had never been born. One cannot thus blow hot and cold. One must be impartially *naïf* or impartially critical.”

Words like those just quoted affect me somewhat as did the recent utterance of a man whose entire life had been devoted to physical researches. This speaker, in the very midst of insisting on the complete right of science to assume that all phenomena belong to its domain, affirmed the human will to be a *vera causa* and to originate changes that run throughout the entire physical universe. Bravo! was my involuntary exclamation; but should not I, as a pronounced spiritualist in psychology, be well beaten and ostracized from the sacred circle of so-called “scientists,” were I to make a similar venture?

As to the explanatory value of the metaphysical postulate of a mind, or soul, I feel obliged to differ greatly from Professor James. That the postulate should not be intruded into the science of psychology, to warp its facts and prejudice its legitimate inductions, I readily admit. Nevertheless, it is a postulate which not only stands as a great light at the end of our pathway, but which also illumines, by interpreting, the significance of every step. Says our author: “I confess, therefore, that to posit a soul influenced in some mysterious way by the brain-states, and responding to them by conscious affections of its own, seems to me the line of least logical resistance, so far as we yet have attained.” Beside this confession I will place my

own, made and defended in another place: "The development of Mind can only be regarded as the progressive manifestation in consciousness of the life of a real being, which, although taking its start and direction from the action of the physical elements of the body, proceeds to unfold powers that are *sui generis*, according to laws of its own."

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